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## Feature Report

***“Iran’s Nuclear Program: Tehran’s Compliance with International Obligations”***. By Paul K. Kerr.  
Published by Congressional Research Service; Updated October 15, 2018

<https://fas.org/sgp/crs/nuke/R40094.pdf>

Several U.N. Security Council resolutions adopted between 2006 and 2010 required Iran to cooperate fully with the International Atomic Energy Agency’s (IAEA’s) investigation of its nuclear activities, suspend its uranium enrichment program, suspend its construction of a heavywater reactor and related projects, and ratify the Additional Protocol to its IAEA safeguards agreement. However, Tehran has implemented various restrictions on, and provided the IAEA with additional information about, its nuclear program pursuant to the July 2015 Joint Cooperative Plan of Action (JCPOA), which Tehran concluded with China, France, Germany, Russia, the United Kingdom, and the United States. On the JCPOA’s Implementation Day, which took place on January 16, 2016, all of the previous resolutions’ requirements were terminated. The nuclear Nonproliferation Treaty (NPT) and U.N. Security Council Resolution 2231, which the Council adopted on July 20, 2015, comprise the current legal framework governing Iran’s nuclear program. Iran has complied with the JCPOA and resolution.

Iran and the IAEA agreed in August 2007 on a work plan to clarify outstanding questions regarding Tehran’s nuclear program. The IAEA had essentially resolved most of these issues, but for several years the agency still had questions concerning “possible military dimensions to Iran’s nuclear programme.” A December 2, 2015, report to the IAEA Board of Governors from agency Director General Yukiya Amano contains the IAEA’s “final assessment on the resolution” of the outstanding issues.

This report provides a brief overview of Iran’s nuclear program and describes the legal basis for the actions taken by the IAEA board and the Security Council. It will be updated as events warrant.

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# NUCLEAR WEAPONS

The National Interest (Washington, D.C.)

## **China is Building More Submarines That Carry Nuclear Weapons. And It Could Be a Good Thing.**

By David Axe

Oct. 27, 2018

*But there is a catch.*

China for decades has struggled to develop nuclear ballistic-missile submarines. The country finally might be on the cusp of deploying reliable boomers.

An effective Chinese ballistic-missile submarine fleet over the long term could have a stabilizing influence on the world's nuclear balance. But in the short term, it might heighten tensions. Especially if Beijing lets popular fervor drive its build-up.

That's the surprising conclusion of a new report from Tong Zhao, a fellow in the Nuclear Policy Program at the Carnegie Endowment for International Peace, based at the Carnegie-Tsinghua Center for Global Policy in Beijing.

"A fleet of survivable nuclear ballistic missile submarines (SSBNs) would reduce China's concerns about the credibility of its nuclear deterrent and lessen the country's incentives to further expand its arsenal," Tong writes.

"Such benefits, however, will be tempered by vulnerabilities associated with Beijing's current generation of SSBNs. In the near to mid-term, developing an SSBN fleet will require China to substantially enlarge its previously small stockpile of strategic ballistic missiles, possibly exacerbating the threat perceptions of potential adversaries and causing them to take countermeasures that might eventually intensify an emerging arms competition."

Beijing began developing boomers as far back as 1958. It wasn't until the late 1980s that the country completed its first boat. But the Type 092 SSBN never deployed on an operational patrol. "It was reportedly too noisy and might have had other safety and reliability issues," Tong explains. "Moreover, the missiles it carried had very short ranges."

The newer Type 094 class of SSBNs, each armed with a dozen, longer-range JL-2 nuclear-tipped missiles, began to enter service around 2006. A Type 094 apparently conducted China's first undersea deterrence patrol in 2015. "China has obtained, for the first time, a demonstrably operational underwater nuclear capability. This represents the start of a new era for China's sea-based nuclear forces."

As of late 2018 there are four Type 094s in service. Beijing has not publicly released a detailed plan for its SSBN fleet expansion, but the U.S. military expects China to build between five and eight of the vessels, in total, according to Tong and various military reports and statements.

The U.S. military has responded to the China's new boomers by boosting its own anti-submarine capabilities. "Between Chinese efforts to create a credible sea-based nuclear deterrent and U.S. endeavors to strengthen anti-submarine countermeasures, tensions are brewing under the surface of the South China Sea and the broader Pacific Ocean," Tong explains.

But the Type 094s and future Chinese SSBNs could actually end up encouraging stability rather than conflict. Today SL-2s about boomers account for nearly half of China's approximately one-hundred-

strong arsenal of long-range nuclear missiles. That proportion is likely to rise as more SSBNs enter service.

As they have the potential to be more survivable than land- and air-launched nukes, the SL-2s could change the attitudes of Chinese leaders toward the country's atomic deterrent. "If China's SSBNs significantly contribute to the credibility of its overall nuclear deterrent, China would have less of an incentive to further enlarge its nuclear arsenal," Tong writes.

In other words, China ultimately might need fewer nukes overall if a larger proportion of the weapons are submarine-launched missiles. In an era of escalating nuclear buildups in the United States and China, a relatively smaller and stabler Chinese arsenal could have a cooling effect, according to Tong.

But Beijing must convince other powers that a growing boomer fleet contributes not only to its own national security, but to the stability of the whole world. "China has a few unilateral steps that it should take to ensure that the growth of its SSBN fleet is as undistruptive as possible to regional security dynamics and to its own security interests."

For one, China must build only as many SSBNs as it truly needs in order to maintain a credible at-sea deterrence. Four or five Type 094s could be enough for one boat to be on patrol at all times. If Beijing builds significantly more than five SSBNs, it could mean that the Communist Party has let irrational nationalistic sentiment shape its force structure, as the Party allegedly has done in its breakneck acquisition of aircraft carriers .

"If China allows nationalistic sentiments to induce it to build a massive sea-based nuclear capability beyond any practical security needs, this could raise doubts in foreign countries about Beijing's strategic intentions and contribute to an unnecessary, damaging strategic arms competition," Tong warns.

But for China's rivals, a small but reliable Chinese boomer fleet could be as calming as a big one is alarming.

<https://nationalinterest.org/blog/buzz/china-building-more-submarines-carry-nuclear-weapons-and-it-could-be-good-thing-34462>

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Homeland Preparedness News (Washington, D.C.)

## **IAEA Launches Training Course to Protect Nuclear Facilities from Cyberattacks**

By Dave Kovaleski

Oct. 25, 2018

The International Atomic Energy Agency (IAEA) launched a new training course on protecting nuclear facilities from cyberattacks.

The course, called Protecting Computer-Based Systems in Nuclear Security Regimes, brought together 37 participants from 13 countries for two weeks of training on best practices in computer security. It was held earlier this month at the Idaho National Laboratory in Idaho Falls.

The training course was the first in a series that will focus on computer security and raising awareness of the threat posed by cyberattacks.

"Everyone with responsibility for nuclear security must have a thorough understanding of the vulnerabilities of their systems – they must know how to prevent and mitigate possible

cyberattacks on those systems,” Raja Adnan, director of the IAEA’s Division of Nuclear Security, said. “The IAEA offers a range of training courses in computer security to help ensure that governments and organizations have the necessary technical, regulatory and other tools to succeed when faced with highly skilled adversaries.”

The course featured mock-ups of actual digital systems common in today’s nuclear facilities. The course — developed by cybersecurity experts from the IAEA, the Idaho National Laboratory, Pacific Northwest National Laboratory, and Los Alamos National Laboratory — featured a learning environment that replicated equipment typically found in a nuclear facility.

“The hands-on lab environment, presentations, and exercises were conducted in a manner that allowed participants of varied experience to gain the full benefit of the training,” James Byrne, a participant from EDF Energy in the United Kingdom, said. “It was a valuable training experience that provided me with many cybersecurity insights that will be helpful for me when I return to work.”

<https://homelandprepnews.com/stories/31029-iaea-launches-training-course-to-protect-nuclear-facilities-from-cyberattacks/>

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National Defense (Arlington, Va.)

## **Tough Choices Ahead for B-21 Program**

By Jon Harper

Oct. 24, 2018

The Air Force wants to beef up its bomber fleet over the next decade. That could be a boon to B-21 Raider manufacturer Northrop Grumman and its industry partners, but it’s unclear whether the initiative will receive sufficient funding.

Secretary of the Air Force Heather Wilson recently said the service needs 74 more squadrons — including five additional bomber squadrons — by 2030 to carry out the national defense strategy. The proposal was based on the preliminary results of a study that the service is conducting. The final report will be delivered to Congress in March.

“Right now we have not got the exact mix of [aircraft] tails,” Chief of Staff Gen. David Goldfein told reporters during a roundtable. “Part of that dialogue will be the costing out the number of tails, the number of pilots, the number of maintainers. And so that’s work that is still to be done.”

In the 2020s, the B-21 will be the only bomber in production. In 2015, Northrop Grumman was awarded a contract to build the new stealth aircraft. Much of the details remain secret, but officials have said they expect the procurement cost not to exceed \$550 million per plane.

The program is being shepherded by the Air Force Rapid Capabilities Office, and the platform is expected to achieve initial operating capability by the mid-2020s.

“One thing they could do [to increase the size of the bomber force] is not retire some of the legacy bombers,” said Todd Harrison, director of defense budget analysis and the aerospace security project at the Center for Strategic and International Studies.

“But I think it’s no secret that the Air Force has been saying for a while that they want to buy more than 100 of the B-21 bombers, and 100 was the baseline on the program. So I fully expect that when

we see the final report, it's going to call for a ... greater number of bombers in production," he added during a briefing with reporters.

However, the Air Force is facing a modernization "bow wave" that includes the B-21 bomber, KC-46 tanker, F-35 joint strike fighter, Minuteman III missile replacements and T-X trainer, he noted.

"They've got all of these major acquisition programs that are planned, and now they are talking about growing force structure on top of that. That's going to be an incredible increase of funding that will be required in the 2020s," Harrison said. "It would behoove the Air Force to come up with a good analysis of what this is going to cost and what kind of tradeoffs they can make in their own budget to pay for this."

Mark Cancian, a senior adviser at CSIS, estimated that the Air Force proposal for adding 74 squadrons would cost an additional \$37 billion per year. Robert Levinson, a senior defense analyst at Bloomberg Government, said a low-end estimate is about \$23 billion in extra funding through 2030.

"Even if the USAF gets the [B-21] jet at the cost it wants, assuming 10 aircraft per squadron it will need another 50 jets, so that's about \$27.5 billion in additional procurement costs," Levinson said in an email. "Finding the money for that is going to be tough."

It's possible that the Air Force will get additional bombers, he said. "But my bet is that that there is no way by 2030 the USAF gets everything it wants, so it will have to make choices," he added. "Where the B-21 falls in the inevitable rack and stack exercise is anyone's guess."

<http://www.nationaldefensemagazine.org/articles/2018/10/24/tough-choices-ahead-for-b-21-program>

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## US COUNTER-WMD

The Japan Times (Tokyo, Japan)

### **U.S. Launches New Missile Defense Command in Japan**

Author Not Attributed

Oct. 29, 2018

U.S. forces in Japan are set to establish a new command for the U.S. Army's ballistic missile defense unit in the Asian country, and have started stationing personnel, it has been learned.

The move is apparently aimed at countering threats from North Korea, which still holds ballistic missiles, as well as from China, which is moving to deploy missiles capable of reaching the U.S. mainland and U.S. military bases in Japan.

A ceremony to mark the formation of the new command at the Army's Sagami General Depot in the city of Sagami-hara, Kanagawa Prefecture, will take place shortly.

According to sources in the Japanese Defense Ministry and U.S. Forces Japan, the personnel for the new command are assigned to the U.S. military's 38th Air Defense Artillery Brigade. They began activities in Japan on Oct. 16.

The Defense Ministry notified the Sagami-hara Municipal Government on Sept. 28 of the planned creation of the new ballistic missile defense command and personnel stationing.

A Sagami-hara municipal official said, "It's very regrettable that the notification was made suddenly without prior consultations."

"It's questionable that such a command will be set up at the Sagami General Depot, which is in charge of logistics for the U.S. Army," the official said, adding that the city will seek detailed explanations from the Defense Ministry and the Foreign Ministry.

A Defense Ministry official said, "In light of promoting quick reaction capability, the command will help strengthen the deterrent power and coping abilities of the Japan-U.S. alliance, and contribute to Japan's national defense and stability in the Asia-Pacific region."

"We'll provide as much information about the command as we can," the official added.

The new command will likely be in charge of directing operations of the Army's X-band radar units, which are deployed in the city of Tsugaru in Aomori Prefecture and the city of Kyotango in Kyoto Prefecture.

A total of 115 personnel will be deployed to the command in stages within six to 12 months. They will use existing facilities, rather than bringing new equipment.

According to officials of U.S. Forces Japan the new command will come under the control of the 94th Army Air and Missile Defense Command, which is based in Hawaii.

By setting up the new front-line command in Japan, the United States apparently aims to be ready to make quicker decisions regarding intercepting missiles while signaling its determination to thwart threats from North Korea and China.

The command is expected to work with a cutting-edge Aegis destroyer within the U.S. Navy's 7th Fleet that is deployed to the Yokosuka base in Kanagawa.

It may also share information with Self-Defense Forces units that will operate the Aegis Ashore land-based missile defense system planned to be deployed by the Defense Ministry in Akita and Yamaguchi prefectures.

The launch of the command is said to be unconnected with the realignment of U.S. Forces Japan.

<https://www.japantimes.co.jp/news/2018/10/29/national/u-s-launching-new-missile-defense-command-japan/>

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Defense News (Washington, D.C.)

## **After Consecutive Failures, Watch US Navy Intercept Test Missile with SM-3 Weapon**

By Aaron Mehta

Oct. 26, 2018

WASHINGTON — The Pentagon intercepted a test ballistic missile with the Standard Missile-3 Block IIA system, the second time that weapon has been successfully tested — a relief for the department following two consecutive test failures.

The SM-3 Block IIA is a co-development between the U.S. and Japan, and is expected to be equipped on both the U.S. Aegis Ashore stations in Romania and Poland and the future Aegis Ashore stations in Japan — making it a keystone to America's short- and intermediate-range missile defense strategies.

The system can be launched from sea or land via the Aegis Ballistic Missile Defense system. The IIA variant comes with enlarged rocket motors and a bigger kinetic warhead, according to industry lead Raytheon.

The intercept occurred off the west coast of Hawaii, when an SM-3 launched by the guided-missile destroyer John Finn destroyed a target launched from the Pacific Missile Range Facility at Kauai.

"This was a superb accomplishment and key milestone for the SM-3 Block IIA return to flight," Missile Defense Agency Director Lt. Gen. Sam Greaves said in a statement. "My congratulations to the entire team, including our sailors, industry partners, and allies who helped achieve this milestone."

"This second intercept for the SM-3 Block IIA is a success we share with the Missile Defense Agency and the country of Japan, our cooperative development partners," Taylor Lawrence, Raytheon Missile Systems president, said in a statement. "Together, we are building the most advanced solutions for ballistic missile defense."

Tests have not always gone smoothly for the new SM-3 system. While the first system test in February 2017 was successful, a second test in June 2017 was washed out after a sailor accidentally triggered the missile's self-destruct feature by misidentifying it as a friendly target. A third test, held in January 2018, ended in a failure that cost taxpayers \$130 million.

Speaking to reporters in March, Greaves emphasized that even in an intercept failure, MDA gains a wealth of knowledge from each test launch. As he put it then: "If North Korea is learning as much as I'm learning from these failures, we all ought to be concerned."

Along those lines, it is notable that the MDA statement said: "Based on observations and initial data review, the test met its objectives. Program officials will continue to evaluate system performance."

<https://www.defensenews.com/naval/2018/10/26/after-consecutive-failures-navy-has-successful-sm-3-missile-intercept/>

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Homeland Preparedness News (Washington, D.C.)

## **OPCW Aligns with UN Peace, Security Initiatives**

By Douglas Clark

Oct. 30, 2018

Organization for the Prohibition of Chemical Weapons (OPCW) member states said they are working in concert with the United Nations (UN) to achieve international peace and security through economic and technological development.

OPCW officials said during the recently conducted third edition of the Forum on the Peaceful Uses of Chemistry, the membership identified activities to help achieve the United Nation's (UN) Sustainable Development Goals (SDGs) initiative.

"The OPCW already supports the UN's Sustainable Development Goals through its core activities to eliminate the global stocks of chemical warfare agents and to promote the peaceful uses of chemistry," H.E. Mr Fernando Arias, OPCW's director-general, said. "Synergies can be found between the OPCW's work to implement the Chemical Weapons Convention and the SDGs."

Attendees participated in panel discussions on a range of topics, including an overview of the SDGs; peaceful application of chemistry; chemical safety, security, and sustainability; gender mainstreaming; and building institutional synergies to promote international cooperation on SDGs.

Over 96 percent of all chemical weapon stockpiles declared by possessor States have been destroyed under OPCW verification. For its extensive efforts in eliminating chemical weapons, the organization received the 2013 Nobel Peace Prize.

The meeting convened over 30 professionals, including chemists, chemical engineers, academics, as well as government and industry officials.

<https://homelandprepnews.com/stories/31098-opcw-aligns-with-un-peace-security-initiatives/>

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## US ARMS CONTROL

Reuters (London, United Kingdom)

### **North Korea Readies Nuclear, Missile Sites for International Inspectors: Yonhap**

By Josh Smith

Oct. 30, 2018

SEOUL (Reuters) - South Korea's spy agency has observed preparations by North Korea for international inspections at several of its nuclear and missile test sites, the Yonhap news agency said on Wednesday, citing a South Korean lawmaker.

Kim Min-ki of the ruling Democratic Party told reporters that intelligence officials had observed what they believed to be preparations for possible inspections at Punggye-ri nuclear test site and the Sohae Satellite launching ground.

The South's National Intelligence Service observed North Koreans "conducting preparation and intelligence activities that seem to be in preparation for foreign inspectors' visit," the lawmaker added, but no major movements were seen at Yongbyon.

Yongbyon is the North's main nuclear complex.

North Korea has stopped nuclear and missile tests in the past year, but it did not allow international inspections of its dismantling of Punggye-ri in May, drawing criticism that the action was merely for show and could be reversed.

In September, its leader Kim Jong Un pledged at a summit with South Korean President Moon Jae-in to also close Sohae and allow experts to observe the dismantling of the missile engine testing site and a launch pad.

At the time, Moon said North Korea agreed to let international inspectors observe a "permanent dismantlement" of key missile facilities, and take further steps, such as closing Yongbyon, in return for reciprocal moves by the United States.

Washington has demanded steps such as a full disclosure of the North's nuclear and missile facilities, before agreeing to Pyongyang's key goals, including an easing of international sanctions and an official end to the Korean War.

American officials have been skeptical of Kim's commitment to giving up nuclear weapons, but the North's pledge at the summit with the South drew an enthusiastic response from President Donald Trump.

Reporting by Josh Smith; Editing by Clarence Fernandez

<https://www.reuters.com/article/us-northkorea-missiles-southkorea/north-korea-readies-nuclear-missile-sites-for-international-inspectors-yonhap-idUSKCN1N50AH>

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NATO (Brussels, Belgium)

## **NATO Arms Control Experts Discuss Weapons of Mass Destruction, Disarmament and Non-Proliferation**

Author Not Attributed

Oct. 29, 2018

A major NATO arms control conference got underway in Iceland on Monday (29 October 2018), as senior experts from more than 50 countries and organizations gathered to discuss the state of global arms control treaties. The two-day conference will cover topics ranging from ballistic missile proliferation and the use of chemical weapons by states and terrorists, to the future of the nuclear Non-Proliferation Treaty (NPT).

"Arms control, disarmament, and non-proliferation are essential for NATO's security and for ensuring strategic stability around the world," said William Alberque, Director of NATO's Arms Control, Disarmament, and WMD Non-Proliferation Centre. "Chemical weapons attacks in Syria and the United Kingdom show that the international non-proliferation regime is being challenged," he said, adding that he expected the conference to reinforce the importance of global non-proliferation norms.

NATO's annual Conference on Weapons of Mass Destruction, Arms Control, Disarmament and Non-Proliferation, the 14th of its kind, is being chaired by Assistant Secretary General for Political Affairs and Security Policy, Ambassador Alejandro Alvargonzález. NATO Deputy Secretary General Rose Gottemoeller and United Nations Under-Secretary-General and High Representative for Disarmament Affairs Izumi Nakamitsu will deliver keynote speeches.

In her prepared remarks, Deputy Secretary General Gottemoeller stressed that the Alliance strongly supports effective arms control agreements and well-established international legal frameworks surrounding them. Turning to the NPT, Gottemoeller emphasized that the treaty is one of the most important international agreements of its kind and that Allies will not support any approaches to disarmament that ignore global security conditions, or undermine the NPT.

NATO has a long record of accomplishments relating to disarmament and non-proliferation. After the end of the Cold War, NATO dramatically reduced the number of nuclear weapons in Europe. Allies support major international arms control treaties, including the Non-Proliferation Treaty, the Chemical Weapons Convention and the Biological and Toxin Weapons Convention. NATO has also helped destroy surplus stocks of small arms, mines and ammunition and cleared thousands of hectares of land mines across Europe.

[https://www.nato.int/cps/en/natohq/news\\_159843.htm](https://www.nato.int/cps/en/natohq/news_159843.htm)

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# COMMENTARY

War on the Rocks (Washington, D.C.)

## **Surviving the U.S. Withdrawal from the Iran Nuclear Deal: What We Do—And Don't—Need to Worry About**

By Eric Brewer

Oct. 29, 2018

In a September interview with Germany's *Der Spiegel*, Iranian Foreign Minister Mohammad Javad Zarif stated that if Europe could not meet Iran's demands for sustained economic benefits following the U.S. withdrawal from the nuclear deal, Tehran would be within its rights to resume some of its nuclear activities. In other words, Iran could expand its nuclear program without walking away from the agreement, known as the Joint Comprehensive Plan of Action (JCPOA). While it is unclear whether this was mere bluster from Tehran's top diplomat — and whether the remaining parties to the deal would agree with his interpretation of its text — it is the latest in a series of threats and announcements, since the United States exited the JCPOA, that Tehran remains ready to quickly resume activities halted under the agreement.

Of course, such rhetoric is primarily meant to put pressure on Europe and other remaining deal participants to offset U.S. economic sanctions. Conventional wisdom is that Iran appears willing to stay in the deal, at least for now.

But this does not mean the United States should not take Iran's threats seriously or refrain from planning for their occurrence. Indeed, U.S. sanctions on Iran's oil and banking sectors — which are the sanctions most likely to put the squeeze on Iran's economy — don't go into effect until November 5, at which point Iran could carry out its threats. In addition, while Europe has taken a few steps to try and blunt the impact of the U.S. pressure campaign and save the deal, such measures will probably have a small effect on reducing the economic pain on Iran. Thus, there is ample reason to worry that Iran could still make good on these threats, sparking an escalatory cycle and increasing the risk of miscalculation and conflict.

This would not be the first time. Beginning in late 2005, Iran removed International Atomic Energy Agency (IAEA) seals and began to resume its fuel cycle activities following a pause in response to the exposure of its then-covert uranium enrichment and reactor-related facilities. Over the next decade, as international pressure increased — including threats of military action — Iran responded by ramping up its program. It is entirely plausible that Iran might do so again to regain negotiating leverage as sanctions begin to bite.

During my time as a senior analyst in the intelligence community and a policymaker at the National Security Council, I watched the pendulum swing from escalation, to negotiations and the completion of the JCPOA, and back to the U.S. withdrawal and resumption of pressure and threats to try and force a new deal. The United States may now need to re-learn old lessons.

If the Trump administration is to successfully manage the risks in this new environment while it tries to reach a better deal, there are six points that the White House, Congress, and American public would do well to keep in mind.

A resumption of nuclear activities prohibited under the JCPOA does not necessarily mean Iran is dashing to a weapon. Following the withdrawal from the deal, President Donald Trump stated that if Iran re-starts its nuclear program, there will be "very severe consequences," echoing a similar statement he made in April, leaving open the possibility of military action. Such vague threats in

response to ambiguous Iranian actions are dangerous, because any Iranian resumption of activities must be interpreted in context. If Iran starts rolling back its commitments, it will likely do so slowly to test the international community's reaction. Efforts to marginally exceed limits on its enrichment level or the amount of material it has on hand, for example, although prohibited by the deal, would almost certainly be for political reasons — to demonstrate to the United States that there are costs for its actions, to appease domestic constituencies, and to acquire negotiating leverage.

Although actions like these would begin to reduce Iran's breakout timeline — the amount of time Iran would need to produce enough fissile material for a weapon — policymakers would still have an ample window to formulate a response. The specifics of the response would depend on the nature of the Iranian transgression. Assuming the deal was still in place, Europe would have JCPOA dispute resolution mechanisms at its disposal, including, if needed, the "snap back" of UN sanctions. The U.S. response could include added diplomatic and economic pressure — preferably as part of a united front with European allies. Finding new, meaningful ways to tighten the vise on Iran, however, will be a challenge for the administration because it is already pursuing a "maximum pressure" strategy.

But threats of military action to deter Iran from increasing its enrichment level by 2 percent or going 20 kilograms over its JCPOA-mandated limit are neither wise nor credible. The United States will need to look at any Iranian nuclear advances in the contexts in which they occur, including whether Iran retains existing transparency measures. This brings me to my next point.

Even if Iran leaves the JCPOA, the international community will almost certainly still have insights into Iran's nuclear program. The international community was not blind to the status of Iran's nuclear activities before the JCPOA and its predecessor, the Joint Plan of Action, and it will likely not be blind without it, provided Iran quits only those requirements associated with the deal.

Before the added monitoring and transparency provisions of the deal, Iran's cooperation with the IAEA and the agency's access to Iran's nuclear program were guided primarily by its nuclear safeguards agreement (as with most countries that possess nuclear material).

If Iran leaves the JCPOA, the safeguards agreement should still allow the IAEA to visit key nuclear sites — albeit probably with less frequency, and without the more robust and short notice inspection benefits of the Additional Protocol (the more extensive verification measures that Iran implements as part of the JCPOA). The IAEA could still monitor Iran's activities, just as it did prior to the JCPOA. This would be less than ideal, but not disastrous. Indeed, senior U.S. intelligence officials have testified that, even before the deal, Iran could not successfully divert nuclear material away from IAEA monitoring and make a bomb without detection.

If the deal collapses or Iran threatens to curb IAEA access, the United States, Europe, China, and Russia, should make it clear to Iran that ditching its safeguards agreement is unacceptable and, at a minimum, they expect it to adhere to the pre-deal IAEA transparency measures. This will ensure that insights into Iran's activities are at least no worse than they were before the deal. If Iran doesn't intend to build a nuclear weapon, and wants to avoid escalating pressure and risks of a military strike, it also has a strong interest in maintaining transparency.

Breakout timelines matter, but not as much as we think. One of the most common criticisms of the JCPOA is that the breakout timelines produced by the deal — which extended the amount of time Iran would need from a few months to a year — are too short, and will inevitably shorten further. This was one of the key "sunset provisions" that allegedly needed fixing. Trump highlighted this critique when he withdrew from the deal, claiming (falsely) that the JCPOA allows Iran to reach "the verge of a nuclear breakout in just a short period of time." The administration's approach to this dilemma so far appears to be focused on insisting on zero enrichment.

Focusing too much on breakout timelines is ill-advised. Not only is Tehran highly unlikely to accept the administration's maximalist position on enrichment, Iran's extensive experience with the technology means that breakout timelines can't be extended to infinity. Knowledge and industrial capacity can't be erased. Finally, producing fissile material is only one part of the equation. Iran must then package this material into an explosive device.

Thus, before doubling down — including threats of military action — on the need to maintain the current one-year breakout timeline, the United States should think carefully about what timelines are actually acceptable, and why. This discussion should be guided not by unachievable conditions or nice round numbers, but rather how long the United States believes it will need to act. Limiting obsession over this number is wise for another reason.

Breakout is probably not the most likely path to an Iranian bomb. Regular IAEA visits are a deterrent against breakout. Producing weapons-grade uranium in full view of the IAEA, or trying to prevent inspectors from entering facilities for a prolonged period, would set off the necessary alarm bells in Washington, Jerusalem, and the rest of the world. Iran probably recognizes this. Of course, the shorter the breakout timeline, the less margin for error — both for the international community, and for Iran. But racing to a single, untested device is far more likely to invite the attack it is trying to deter.

Moreover, the West's disclosure of the undeclared Fordow enrichment facility in 2009 suggested that Iran's strategy, at least until that point, was focused on developing nuclear capabilities in secret. In other words, if Iran wanted a nuclear weapon, breakout was never a preferred option, an assessment the U.S. intelligence community made in 2007. If forced to choose, the United States should prioritize preserving those aspects of the deal — such as the robust monitoring provisions that apply to Iran's entire fuel cycle and the Additional Protocol — that improve the international community's ability to detect and deter Iran's potential covert paths to a nuclear weapon.

As the administration tries to improve upon these measures, it needs to keep one thing in mind.

No deal can provide the United States with 100 percent confidence that Iran is not cheating. This was true for the JCPOA, and it will be true of any future deal the Trump administration secures. National Security Advisor John Bolton's claim that the JCPOA was jettisoned because it could not reach such a threshold is a straw man argument, akin to arguing that you should not eat healthy and exercise because you can't guarantee that doing so won't prevent a heart attack. Robust monitoring and verification — like diet and exercise — significantly increase the likelihood that the international community can detect Iranian cheating. How effectively these measures do so and how effectively U.S. policy requires that they do so depend on numerous factors, some of which the United States can control (e.g., its own political objectives), some of which it can influence (e.g., the access provided to inspectors), and some of which are already determined (e.g., how much the international community knows about the program before a deal).

Developing an effective monitoring apparatus is art, not science. It is an exercise in minimizing uncertainty and managing risk. The JCPOA has accomplished this exceedingly well, as evidenced by repeated certifications by the IAEA and by U.S. officials that Iran is complying with the agreement. In pursuing a new deal, the Trump administration should not let an idealized, but illusory, concept of "perfect" verification be the enemy of "sufficient" verification.

Additional nuclear proliferation in the region hinges on more than just the fate of the JCPOA. Days after Trump announced the U.S. withdrawal from the deal, the Saudi foreign minister stated that if Tehran gets the bomb, Riyadh would, too. Although such claims by Saudi Arabia are not new, Trump's critics used this to lament that leaving the JCPOA was a strategic mistake.

Making a case that the JCPOA (or its demise) will cause additional regional proliferation is difficult, in part because the data is limited. The deal has only been in existence a few years, and is already imperiled. On the one hand, the agreement's predictability — in that it capped Iran's nuclear capabilities — and the added ability to detect an Iranian bomb should have a stabilizing effect, reducing incentives for other countries to pursue nuclear weapons. The Obama administration made this argument. On the other hand, the expiration of some of those caps on Iran's capabilities is equally predictable. Trump made this case when announcing the U.S. withdrawal, stating that if the deal remained, "there would soon be a nuclear arms race in the Middle East." In addition, Arab leaders believed the deal would only empower Iran, and it reinforced doubts about Washington's judgment and defense commitments. Finally, other Middle East countries are woefully behind Iran when it comes to domestic nuclear technology, and could have used that time to catch up. All of these factors should create pressures for proliferation.

That there is no publicly available evidence that Arab states were racing for a bomb before or after the JCPOA should make us cautious in claiming that the deal will single handedly determine proliferation one way or the other. (There is evidence, however, that the deal may have created incentives for at least one country to develop a hedging strategy.) In either case, future proliferation decisions by regional countries will take into account several factors: the status of Iran's nuclear program, confidence in U.S. security guarantees, and, perhaps most importantly, the perceived technical, political, and economic risks and costs to pursuing domestic nuclear weapons capabilities. That conclusion is both frightening, as these factors are in flux, and reassuring, because the United States has the power to influence them.

Navigating the risks of the coming months — and perhaps years — will be difficult, if the decade prior to the deal is any indication. But even if Iran were willing to meet with the United States tomorrow, would American policymakers be ready? The Trump administration must move beyond simplistic criticisms of the JCPOA and unrealistic demands on Iran, and toward more limited, concrete proposals that have a chance of working. The United States has saddled itself with a difficult, if not impossible, task. Withdrawal from the deal means Trump now owns the consequences of that decision. He would do well to learn from his predecessors.

<https://warontherocks.com/2018/10/surviving-the-u-s-withdrawal-from-the-iran-nuclear-deal-what-we-do-and-dont-need-to-worry-about/>

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Freeman Spogli Institute for International Studies (Stanford, Calif.)

### **After INF, Is New START Next to Go?**

By Steven Pifer

Oct. 25, 2018

President Donald Trump has announced that the United States will withdraw from the 1987 Intermediate-range Nuclear Forces Treaty. His National Security Advisor, John Bolton, discussed that with Russian officials in Moscow earlier this week.

The president's decision is a mistake. Will he make an even bigger error by withdrawing from—or not extending—the 2010 New Strategic Arms Reduction Treaty?

The president's decision now ensures the United States gets the blame for the treaty's demise.

To be sure, Trump had grounds for abandoning the INF Treaty. Moscow violated the agreement by deploying a prohibited intermediate-range cruise missile. The Russians have resisted U.S. entreaties since 2013 to come back into compliance.

The president's decision now, however, ensures the United States gets the blame for the treaty's demise. It has already provoked criticism from NATO allies. Withdrawal will leave Russia free to deploy land-based intermediate-range missiles to target Europe and Asia, missiles for which the U.S. military currently has no counterpart. Trump's announcement undoubtedly prompted cheers in the Kremlin and Russian Ministry of Defense.

Once the INF Treaty lapses, only one agreement will remain to constrain U.S. and Russian nuclear forces: the 2010 New Strategic Arms Reduction Treaty.

New START is in the U.S. interest. It nonetheless has several strikes against it.

New START limits the United States and Russia each to no more than 1,550 deployed strategic warheads and no more than 700 deployed strategic missiles and bombers. Its provisions for data exchanges, notifications and inspections yield a huge amount of information on Russian strategic forces

New START is in the U.S. interest. It nonetheless has several strikes against it.

First, it was signed by Barack Obama. We know how Trump feels about anything his predecessor did. In January 2017, he dismissed New START as a bad Obama deal in his first Oval Office phone conversation with Vladimir Putin.

Second, Trump enjoys tearing up agreements. The INF Treaty will join the Trans-Pacific Partnership, Paris Climate Accord, Joint Comprehensive Plan of Action with Iran and others in the growing list of international pacts trashed by his administration.

Third, Bolton disdains arms control. He opposed New START, in part because the treaty entailed equal limits for the United States and Russia.

Unlike the INF Treaty, however, Russia has complied with New START's limits. The U.S. military very much approves of the treaty. A decision to withdraw would provoke a political firestorm, including from Republican ranks.

The more relevant question thus may be: will Trump let New START lapse when its term expires in 2021, or will he agree with Putin to extend the treaty for five years? The treaty allows for the latter, and the Russians have indicated interest.

Unfortunately, Bolton has alternative ideas. One would return to the 2002 "Treaty of Moscow" model, which limited deployed warheads but not missiles and bombers. Putin was desperate for a treaty in 2002. That's not the case today. The Russians would not accept an agreement that left missiles and bombers unconstrained, especially when the United States has a numerical advantage.

Bolton also suggested renegotiating New START. That would open the path to new Russian demands. Any agreement would need years to negotiate, if possible at all.

Extending New START should be a no-brainer.

Extending New START offers the logical step. Doing so would continue to 2026 New START's limits on the number of Russian strategic weapons, at a time when Russia has hot production lines churning out new strategic arms. Extension would not crimp U.S. plans. The Pentagon designed its strategic modernization programs to fit within New START's limits.

Extension would also continue the flow of information and transparency that the two countries obtain from the treaty's verification measures. The cost of getting that information through other means, such as photoreconnaissance satellites, would run into the tens of billions of dollars.

New START extension would provide an important measure of stability to the troubled U.S.-Russia relationship. Politically, it would give a boost to bilateral relations.

Extending New START should be a no-brainer, and the sooner, the better.

Secretary of Defense James Mattis and Chairman of the Joint Chiefs of Staff Joseph Dunford should press the extension case with Trump. They are the ones who otherwise will have to develop plans to deal with an unconstrained nuclear arms competition with Russia as well as the costs of replacing New START's verification measures.

Judging from personalities in the White House, they could face an uphill battle. But it's one they need to win to save Trump from a blunder that would further diminish U.S. national security.

Faculty views expressed here do not necessarily represent those of the Freeman Spogli Institute for International Studies or Stanford University, both of which are nonpartisan institutions.

<https://medium.com/freeman-spogli-institute-for-international-studies/after-inf-is-new-start-next-to-go-5dd70a384de1>

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The Hill (Washington, D.C.)

## **A Better Way to Confront Russia's Nuclear Menace**

By Elizabeth Sherwood-Randall

Oct. 28, 2018

Ongoing Russian violations of the Intermediate Range Nuclear Forces (INF) Treaty need to be effectively addressed because they defy a longstanding bilateral agreement and directly threaten our NATO allies. However, the Trump administration's move to pull out of the treaty is misguided; instead, we should launch a major initiative to strengthen strategic stability between the United States and Russia. The additional notice by national security adviser John Bolton that the United States is "considering its position about New START" — the 2010 New Strategic Arms Reduction Treaty — is another example of escalatory rhetoric and illogical action that will undermine, rather than enhance, nuclear security.

Over the past five years, it has become increasingly evident that the Russians were cheating on the agreement negotiated between Presidents Ronald Reagan and Mikhail Gorbachev that put an end to an escalating short- and medium-range nuclear arms race in Europe. It was a landmark achievement, and substantially diminished nuclear risks for decades.

Reducing reliance on this class of weapons, also called "tactical" nuclear weapons, has been a focal point of U.S. arms control efforts because they are stationed closer to a potential battlefield and, therefore, can be subject to a variety of greater risks of accidental use or theft. We have actively encouraged other nuclear powers to steer clear of fielding such systems because of the risks they pose. In major initiatives to reduce reliance on nuclear weapons without undermining deterrence between the legacy nuclear superpowers, the U.S. reduced its arsenal to approximately 500 and Russia to between 1,000 and 2,000, according to public documentation.

This imbalance — and it may be even greater — has been a legitimate concern, and we have sought to persuade Moscow to further reduce its deployments. Now, by unilaterally withdrawing from the INF Treaty, the United States is giving Moscow a free pass to not just violate the treaty on a relatively small scale but to rapidly accelerate its redeployments of tactical nuclear weapons without constraints.

Of even greater consequence to our security are strategic nuclear weapons that can target the U.S. homeland from Russia, and vice versa. When managed shrewdly, these weapons can provide both deterrence and strategic stability. President Trump is on the record disparaging New START, calling it a “bad deal” in February 2017. Scrapping this pact — negotiated, signed and implemented in the past decade — is a dangerously destabilizing gambit because it caps the United States and Russia at 1,550 deployed strategic warheads each. Moreover, we know that Russia is seeking an extension of New START, and a U.S. decision to break the agreement would give away significant leverage that should be deployed at the negotiating table.

The more exigent real challenge U.S. nuclear planners now face is the growing evidence that Russia is pursuing new nuclear capabilities that are not constrained by existing agreements limiting strategic weapons. Rather than leap to an escalatory response, the Trump administration needs to tackle these legitimate concerns in a structured dialogue at the highest levels, involving a joint negotiating team from the White House and the Departments of State, Defense and Energy. The agenda must be comprehensive, covering strategic weapons, tactical weapons and new nuclear capabilities — capabilities that the United States has chosen not to pursue in the interest of reducing reliance on nuclear weapons in its national security strategy.

Reducing nuclear risks is a solemn responsibility that both Washington and Moscow bear as the two Cold War-legacy nuclear superpowers. This does not mean reducing the effectiveness of, or giving up, the U.S. nuclear deterrent, which remains the ultimate guarantor of our security and the security of our allies around the world. Rather, it means managing our present and future arsenal in such a way that we strengthen the balance that prevents Moscow (or another nuclear power) from making the misjudgment that it can prevail in a nuclear or conventional attack.

In the past, a bipartisan consensus has supported efforts to reduce threats emanating from nuclear weapons through a variety of agreements and mechanisms, and those commitments have been sustained across multiple administrations. Deliberate withdrawals from international agreements, treaties, and processes — and threats to withdraw from even more — have devalued the word of the United States in current and future negotiations, reduced confidence in existing American commitments around the world, and emboldened our adversaries to test us.

Working to enhance nuclear deterrence and strengthen strategic stability, while reducing nuclear proliferation around the world, is a core responsibility for the President of the United States and his leadership team. It is a no-fail mission on behalf of the American people and our allies and partners on which this administration’s performance must be judged. The challenges posed by Russian treaty violations are real, but we should draw on substantial prior positive experience in reducing nuclear dangers.

Despite the negative spiral of our post-Cold War relationship, Washington and Moscow still share a solemn responsibility for, and stake in, reducing nuclear dangers.

<https://thehill.com/opinion/national-security/413116-a-better-way-to-confront-Russias-nuclear-menace>

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Defense News (Washington, D.C.)

## **America Must Invest in R&D, Personnel for Arms Control Verification**

By Nancy Jo Nicholas

Oct. 26, 2018

Verifying arms control agreements is one of the global community's greatest security challenges.

Even a century ago, when a nation's military might could be measured by conspicuous assets such as tanks and battleships, confirming their numbers was difficult. Today, when possession of even a small amount of nuclear material can make a nation a formidable adversary, verification is even harder.

Given this, we need to actively pursue state-of-the-art physics to provide tools to ensure nations are complying with international treaties. Without those tools, we stand exposed to new threats that could slip under the shield of an unverifiable treaty.

We learned this lesson in the Cold War with the Limited Test Ban Treaty of 1963. Signed by the United States, the Soviet Union and the United Kingdom in August 1963, it prohibited nuclear weapons tests "or any other nuclear explosion" in the atmosphere, outer space and underwater. The only problem: We couldn't verify it — not yet anyway; the technology didn't exist.

Scientists and engineers at Los Alamos National Laboratory had been working to develop nuclear detonation-detection satellites for four years, but they weren't ready. So they did what they had to do: They moved quickly.

On October 17, 1963, just a week after the treaty went into effect, the first pair of Vela satellites equipped with 12 X-ray detectors and 18 neutron and gamma ray detectors were launched, marking the beginning of space-based nuclear test monitoring.

This illustrates why we must invest in science and technology before we're confronted with the need for it. The reality is as technology advances, so must our nuclear-detection instruments. The New START treaty limits the United States and Russia to 1,550 strategic nuclear weapons each. Our current tools, while sophisticated, cannot distinguish between a tactical nuclear weapon and a strategic one. Given that the tactical weapons are intended for small areas like battlefields, while strategic weapons are intended for much larger targets, this information would be critical for the intelligence community to know.

Creating the tools to distinguish these weapons requires us to push the boundaries of physics and explore what else is possible. That is done using Big Science, an approach that originated during the Manhattan Project in 1943, when J. Robert Oppenheimer brought together some of the brightest scientific minds from across the nation, as well as several brilliant refugee scientists from Europe, to Los Alamos, New Mexico, to build the first atomic bomb.

It was the first time researchers from a broad range of disciplines — physics, chemistry, mathematics, engineering — assembled under one roof to solve a seemingly unsolvable problem. They succeeded, and the vital importance of the Big Science model was validated.

This model continues to drive innovation at our nation's nuclear weapons laboratories, including Los Alamos, where the country's nuclear-detection expertise resides. Unsurprisingly, these laboratories provide the nation's best defense against nuclear proliferation. We know how nuclear weapons are made, we know what they look like, we know the ratio of materials and we know how they work. Our expertise can assist a non-nuclear state, such as South Korea, that lacks that capability, yet understandably has a very keen interest in knowing whether its neighbor to the north is pursuing a nuclear weapons program. While we can't give them classified information to

make that determination for themselves, we can develop tools so that South Korea, or any other nation, can know with confidence the status of a country's nuclear program.

While North Korea is currently a vivid red dot on the global radar screen, they are not the only nuclear threat we face.

Sometime in the coming years, the United States and Russia will likely engage in a number of treaty negotiations on nuclear weapons and nuclear material. In treaty verification, the job of scientists is to develop tools to provide confidence — both to the stakeholders in our own countries and, to some extent, to the international community. To do this, we need more investment in research and development, and more scientists and engineers committed to national security. It is only then that we can ensure the successful enforcement of treaties that make the world a safer place.

Nancy Jo Nicholas is the head of Global Security at Los Alamos National Laboratory.

<https://www.defensenews.com/industry/techwatch/2018/10/26/america-must-invest-in-rd-personnel-for-arms-control-verification/>

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## ABOUT THE USAF CSDS

The USAF Counterproliferation Center (CPC) was established in 1998 at the direction of the Chief of Staff of the Air Force. Located at Maxwell AFB, this Center capitalizes on the resident expertise of Air University — while extending its reach far beyond — and influences a wide audience of leaders and policy makers. A memorandum of agreement between the Air Staff's Director for Nuclear and Counterproliferation (then AF/XON) and Air War College commandant established the initial personnel and responsibilities of the Center. This included integrating counterproliferation awareness into the curriculum and ongoing research at the Air University; establishing an information repository to promote research on counterproliferation and nonproliferation issues; and directing research on the various topics associated with counterproliferation and nonproliferation.

In 2008, the Secretary of Defense's Task Force on Nuclear Weapons Management recommended "Air Force personnel connected to the nuclear mission be required to take a professional military education (PME) course on national, defense, and Air Force concepts for deterrence and defense." This led to the addition of three teaching positions to the CPC in 2011 to enhance nuclear PME efforts. At the same time, the Air Force Nuclear Weapons Center, in coordination with the AF/A10 and Air Force Global Strike Command, established a series of courses at Kirtland AFB to provide professional continuing education (PCE) through the careers of those Air Force personnel working in or supporting the nuclear enterprise. This mission was transferred to the CPC in 2012, broadening its mandate to providing education and research on not just countering WMD but also nuclear operations issues. In April 2016, the nuclear PCE courses were transferred from the Air War College to the U.S. Air Force Institute for Technology.

In February 2014, the Center's name was changed to the Center for Unconventional Weapons Studies (CUWS) to reflect its broad coverage of unconventional weapons issues, both offensive and defensive, across the six joint operating concepts (deterrence operations, cooperative security, major combat operations, irregular warfare, stability operations, and homeland security). The term "unconventional weapons," currently defined as nuclear, biological, and chemical weapons, also includes the improvised use of chemical, biological, and radiological hazards. In May 2018, the name changed again to the Center for Strategic Deterrence Studies (CSDS) in recognition of senior Air Force interest in focusing on this vital national security topic.

The Center's military insignia displays the symbols of nuclear, biological, and chemical hazards. The arrows above the hazards represent the four aspects of counterproliferation — counterforce, active defense, passive defense, and consequence management. The Latin inscription "Armis Bella Venenis Geri" stands for "weapons of war involving poisons."

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